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10/730,767	12/08/2003	Shingo Kiuchi	9333-361	3437

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EXAMINER	
WOZNIAK, JAMES S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/730,767	KIUCHI ET AL.	
	Examiner	Art Unit	
	James S. Wozniak	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 November 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the office action from 8/7/2007, the applicant has submitted an amendment, filed 11/7/2007, amending independent claims 1, 8, and 15, while arguing to traverse the art rejection based on the limitation regarding generating a plurality of speech data to be analyzed by a speech recognition engine *(Amendment, Pages 8-9)*. Applicant's arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments.

2. In response to the amendment of Figs. 6-7, the examiner has withdrawn the previous corresponding drawing objections.

3. In response to the amended claims, the examiner has withdrawn the previous objections drawn to antecedent basis and acronym meaning issues.

Response to Arguments

4. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to independent **Claims 1, 8, and 15**, the applicant first argues that Fujii et al *(U.S. Patent: 4,885,791)* fails to teach "generating a plurality of pieces of data to be analyzed by a speech recognition engine" because Fujii instead "modifies the recognition analysis (i.e., pattern matching algorithm) for each proposed period of time (start and end points)" *(Amendment, Page 8)*. In response, the examiner notes that the different proposed speech periods taught by Fujii does anticipate the aforementioned claim limitation.

More specifically, Fujii teaches that in speech recognition, erroneous recognition can occur due to ambiguous speech boundaries *(including starting points)* as a result of unvoiced sounds or noise *(Abstract; and Col. 8, Lines 11-49)*. In order to compensate for the likelihood of such a recognition error, Fujii teaches that multiple speech segment periods are extracted from an input speech signal *(Col. 8, Lines 11-49)*. These multiple speech period segments *(including different starting points)* are then input to a pattern matcher to determine distance/similarity measures between speech patterns in memory and the multiple extracted segments *(Col. 8, Lines 35-49)*. The matching algorithm used between the patterns and the input speech segments is a distance measurement , wherein it is the period that is changed *(not the algorithm as argued by the applicant)* to compensate for ambiguous speech boundaries *(Col. 7, Line 38- Col. 8, Line 49)*. The use of multiple speech period segments in a matching algorithm is further evidenced by Figure 7, which shows that an output of a speech period detector 43 is fed into the input of a pattern matcher 45. Thus, since Fujii discloses generating multiple speech period segments which are then utilized for speech recognition pattern matching, Fujii anticipates the aforementioned claim limitation.

The difference between the system/method taught by Fujii and that recited in the claimed invention is the manner in which a most likely recognition output is selected. In Fujii, as is noted above, a distance comparison is utilized between the multiple speech period segments and patterns in memory, while the present invention uses a most commonly recognized result from a plurality of the same instance of a speech input with different starting points. In other words, Fujii selects the overall best candidate word resulting from pattern matching, while the presently claimed invention selects the most likely result occurring the most often from the result of each segment matching. This concept of selecting a speech recognition output is known in the prior art, however, as is evidenced by Keiller (U.S. Patent: 6,975,993). Keiller teaches that a most commonly occurring word is selected as a recognition result (Col. 21, Lines 1-11). Although directed to an instance of multiple recognizers, the concept of Keiller is based on determining a best result for multiple recognition passes, as is the case with Fujii (i.e., performing a pattern matching processes for multiple speech period segments). Being directed to multiple recognizers, Keiller would also allow the multiple segments to be analyzed more efficiently and concurrently *(Col. 2, Lines 4-8; and Col. 21, Lines 1-11)*. Thus, Keiller does fill the gap in the teachings of Fujii. In response to the further argument that Keiller only teaches analysis for a single piece of data *(Amendment, Page 9)*, the examiner notes that the generation of multiple speech period segments is taught by Fujii (see above).

Thus, for at least the above reasons, claims 1, 8, and 15 remain rejected.

With respect to dependent **claims 2, 9, and 16**, the applicant argues that Bi et al *(U.S. Patent: 6,324,509)* does not teach "sequential shifting" used to generate speech periods having different start times *(Amendment, Page 10)*. In response, the examiner notes that this feature is

taught by the combination of the teachings of Fujii and Bi. As noted above, Fujii discloses the generation of multiple successive speech period segments to be utilized in pattern matching, but does not explicitly mention obtaining these different by shifting backwards. Bi, however, recites this concept in using a look back from a speech start point of a speech input stored in a buffer *(Col. 5, Lines 12-31)*. In the case of Fujii, multiple periods, including starting points are generated, thus, the combination of Fujii and Bi would yield successive "looking back" into a buffer to generate the multiple periods for the benefit of enabling real-time processing on continually received input speech *(Col. 5, Lines 24-30)*. The use of Bi's buffer look-back would also provide the benefit of storing speech data before a detected speech onset, thus ensuring that unvoiced or noise data that is part of an ambiguous boundary can be stored for analysis in Fujii.

Thus, for at least the above reasons, claims 2, 9, and 16 remain rejected.

The art rejection of the remainder of the dependent is traversed for reasons similar to claims 1, 8, and 15 *(Amendment, Page 9)*. In regards to such arguments, see the response directed towards claims 1, 8, and 15.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1, 7-8, and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al *(U.S. Patent: 4,885,791)* in view of Keiller *(U.S. Patent: 6,975,993)*.

With respect to **Claims 1 and 8**, Fujii discloses:

Generating, from speech data for which speech recognition is to be performed, a plurality of pieces of speech data whose start positions of non-speech regions differ *(generating plural possible speech periods having different starting boundaries including varying amounts of unvoiced sounds and noise, Col. 8, Lines 11-49)*; and

Performing speech recognition using each of said pieces of speech data to obtain a plurality of recognized results *(performing pattern matching using the plural possible speech segments, Col. 8, Lines 11-49)*.

Although Fujii discloses the generation of a plurality of possible speech segments for recognition, which each have different starting boundaries including varying amounts of unvoiced sounds and noise and performing speech recognition using those segments, Fujii does not teach providing a speech recognition result using a metric based on the identified most numerous recognized result from among a plurality of obtained recognized results. Keiller, however, recites a plurality of recognition engines utilizing such a metric *(most commonly occurring word or words as recognition result, Col. 21, Lines 1-11)*.

Fujii and Keiller are analogous art because they are from a similar field of endeavor in speech recognition systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Fujii with the recognition means utilizing the aforementioned scoring metric as taught by Keiller in order to provide a more

efficient multi-engine speech recognizer capable of providing a most likely result *(Keiller, Col. 2, Lines 4-8; and Col. 21, Lines 1-11).*

With respect to **Claim 7**, Keiller discloses the multi-engine speech recognizer as applied to Claim 1.

Claim 15 contains subject matter similar to Claims 7 and 8, and thus, is rejected for the same reasons.

7. **Claims 2-6, 9-14, and 16-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al in view of Keiller and further in view of Bi et al *(U.S. Patent: 6,324,509).*

With respect to **Claims 2, 9, and 16**, Fujii in view of Keiller discloses the speech recognition system utilizing a plurality of speech segments, each having different starting boundaries including varying amounts of non-speech data, as applied to claim 1. Fujii further discloses predetermined speech period offset times to include varying amounts of non-speech data *(Col. 10, Line 67- Col. 11, Line 20).* Fujii does not specifically suggest that this plurality of segments is obtained by shifting backwards. Such a backward shift for determining a starting point *(or multiple starting points in the case of Fujii)* of a speech data segment is well known in the speech processing art however, as is evidenced by the Bi reference *(Col. 5, Lines 13-30).*

Fujii, Keiller, and Bi are analogous art because they are from a similar field of endeavor in speech recognition systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Fujii in view of Keiller with the concept of backwards searching (shifting) taught by Bi in order to provide a well-known means

of achieving the multiple speech data periods in Fujii that can be easily implemented in a real-time processor *(Bi, Col. 5, Lines 24-30)*.

With respect to **Claims 3, 11, and 19**, Bi further shows a speech segment endpointer, which determines a speech starting point, as part of a speech recognizer *(Fig. 1, Element 22)*.

With respect to **Claims 4, 12, and 20**, Bi discloses the means for determining a speech segment starting point in a speech recognizer, as applied to claim 3, while Fujii discloses that the period of this input segment can be varied to account for an uncertain amount of non-speech data, as applied to Claim 1. Since the period of the speech data is varied only based on an uncertain amount of non-speech data, the speech region would be the same for the plurality of generated segments in Fujii, and thus, identical to the first speech data starting point determined by the endpointer taught by Bi.

With respect to **Claims 5, 13, and 17**, Fujii further discloses an A/D conversion of an input speech signal at a predetermined sampling frequency *(Col. 8, Lines 14-16)*, while Bi discloses an circular buffer that stores a sequence of speech data frames in order *(Col. 5, Lines 13-30)*. Bi also discloses changing a buffer reading position to determine a speech data starting point, as applied to Claim 2.

With respect to **Claims 6, 14, and 18**, Fujii discloses that individual speech samples are obtained at a rate of 8kHz *(Col. 8, Lines 14-16)*.

With respect to **Claim 10**, Fujii further discloses predetermined speech period offset times to include varying amounts of non-speech data *(Col. 10, Line 67- Col. 11, Line 20)*.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Jaramillo et al *(U.S. Patent: 6,397,180)* discloses a method that identifies the recognized word most common across multiple speech input attempts to determine a recognition output.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
1/8/2008